Claims

1. Agents for the inhibition of the assembly and the maturation of virus structure proteins, characterised in that they contain, as active ingredients, at least one inhibitor of cellular chaperones, or a chemical chaperone, in a pharmaceutical preparation.

2. Agents according to claim 1, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which hinder, regulate, or otherwise influence the folding and proteolytical maturation of virus proteins and through this hinder the release and the replication of viruses, especially of pathogens infectious diseases such as AIDS, hepatitis, hemorrhagic fever, SARS, smallpox, measles, polio, herpes virus infections or the flu (influenza).

3. Agents according to claim 1 or 2, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which especially influence the enzymatic activities of molecular folding enzymes in the host cell.

4. Agents according to claim 3, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which are absorbed by cells of higher eucaryotes and after cell absorption block the protein convolution of virus structure proteins.

5. Agents according to claim 1 to 4, characterised in that the pharmaceutical preparation next to inhibitors of cellular chaperones, or chemical chaperones, also contains other effective substances, especially chemotherapeutics, which are known for their anti-viral effects.

6. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones substances, are used which are administered in various forms *in vivo* orally, intravenously, intramuscularly, subcutaneous or in encapsulated form with or without cell type specificity determining changes, based on the use of a specific application- and/or doses-regime, show a low zytotoxivity, trigger no or irrelevant side effects, show a relatively high metabolic half-life, and a relatively low clearance-rate in the organism.

7. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which

a) are isolated in their natural form micro-organisms or other natural sources,

b) arise through chemical modifications of natural substances, or

c) are produced totally synthetic, or

d) are synthesised *in vivo* through gentherapeutical methods.

8. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones substances, are used which disturb the highly organised processes of the assembly and of the proteolytical maturation of virus structure proteins and through this prevent the release and production of descendent viruses.

9. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones substances, are used which regulate, disturb or block the folding of viral proteins.

10. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which disturb the later processes of virus replication such as assembly, budding, proteolytical maturation and virus release.

11. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which disturb the proteolytic maturation of precursor proteins of the viral polyproteins.

12. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which block the activity of viral proteases.

13. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which disturb the activities of cellular proteases that are involved in the virus maturation.

14. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones substances, are used which exhibit a wide spectrum of efficacy and are therefore used as innovative broadband virostatica for the prophylaxis and/or for the therapy of various virus infections.

15. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which block cellular chaperones such as heat shock proteins (hsp).

16. Agents according to claim 15, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which hinder the activities of the heat shock proteins Hsp40, Hsp70, 90, Hso27 and Hsc70.

17. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which belong to the following substance classes and their derivates: Geldanamycin, Deoxyspergualin, 4-PBA or Herbimycin A.

18. Agents according to claims 1 to 4, characterised in that as chemical chaperones substances are used which regulate, disturb or block the protein conformation and the folding of viral proteins.

19. Agents according to claim 18, characterised in that as chemical chaperones substances such as Glycerol, Trimethylamins, Betain, Trehalose or deuterised water (D_2O) are used.

20. Agents according to claims 18 and 19, characterised in that as chemical chaperones substances are used which are suited for the treatment, therapy and inhibition of infections with various human pathogenic and even animal pathogenic viruses.

21. Agents according to claims 1 to 4, characterised in that as inhibitors of cellular chaperones, or chemical chaperones, substances are used which are suited for the treatment, therapy and inhibition of infections with causative pathogens of chronically infectious diseases such as AIDS (HIV-1 and HIV-2), from hepatitis (HCV and HBV), from the causative pathogens of the "Severe Acute Respiratory Symptoms" (SARS), from SARS-CoV (Corona virus), from smallpox viruses, from the causative pathogens of viral hemorrhagic fever (VHF) such as the Ebola-virus as a representative of the family of Filoviridae, of flu-inducing pathogens such as the Influenza-A-virus.

22. Use of inhibitors of cellular chaperones. or of chemical chaperones, according to claims 1 to 21 for the inhibition of the assembly and the maturation of virus structure proteins.

23. Use of inhibitors according to claim 22 for the inhibition of the entry/internalisation process, the replication, and the maturation and release of *Flaviviridae.*

24. Use of inhibitors according to claims 22 and 23 for the inhibition of the later processes in the life cycle of *Flaviviridae.*

25. Use according to claims 22 to 24, characterised in that inhibitors of cellular chaperones, or chemical chaperones, widely or totally trough blockage prevent the production of infectious virions of *Flaviviridae*-infected cells.

26. Use according to claim 22, characterised in that inhibitors of cellular chaperones, or chemical chaperones, cause the inhibition of the release of virions as well as the almost complete reduction of the infectivity of the released virions.

27. Use according to claim 22, characterised in that inhibitors of cellular chaperones, or chemical chaperones, repress the virus reproduction and through this a new infection of the host cells and therefore the spread of an infection *in vivo*, in the case of the hepatitis-C-virus in the liver tissue of an infected person.

28. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 22 to 25 for the inhibition of the reproduction of Flaviviridae according to the mechanisms

a) blockage/reduction of the release of new virions,
b) blockage/reduction of the infectivity of released virions,
c) blockage/reduction of the infection expansion in the cultures of the host cell,
d) blockage/reduction of the infection expansion in infected organs *in vivo*.

29. Use of inhibitors of cellular chaperones or of chemical chaperones according to claims 22 to 28 for the repression of Flavivirus-infections and Pestivirus- infections in humans and animals.

30. Use of inhibitors of cellular chaperones or of chemical chaperones according to claims 22 to 27 for the induction of the cell death of Hepato-carcinoma cells.

31. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 22 to 30 for the repression and/or prevention of the development of liver cell carcinomas.

32. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 30 and 31 for the therapy of patients with established liver cell carcinomas.

33. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 30 to 32 for the treatment/combat/prevention of
33.1 HCV-induced liver cirrhosis, and/or
33.2 HCV-induced liver cell carcinomas,
33.3 medicine-induced liver carcinomas,
33.4 genetically conditioned liver carcinomas,
33.5 through the environment induced liver carcinomas, and/or
33.6 through a combination of viral and non-viral factors induced liver carcinomas.

34. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 30 to 33 for the aimed elimination of liver carcinoma cells which develop as the result of an
30.1 HCV-infection, or
34.2 corresponding co-infection of HCV and HBV, or
34.3 HDV/HBV/HCV co-infection, or
34.4 HIV/HCV co-infection, or
34.5 HCV and a co-infection with other viruses, bacteria or parasites.

35. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 28 and 29 for the regeneration of patients after a Flavivirus- infection.

36. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 29 to 35 for the regeneration of farm animals after a Flavivirus – or Pestivirus- infection.

37. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 30 to 34 for the reduction of the number of infected virus-producing cells in the liver cell tissue.

38. Use according to claims 23 to 25, 28, 29 as well as 35 and 36, characterised in that inhibitors of cellular chaperones, or chemical chaperones, change the post-translational modification and proteolytic processing of the *Flaviviridae* structure proteins as well as reduce the dimerization of the virus-envelope-proteins and through this reduce or block the release and infectivity of *Flaviviridae*.

39. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 22 to 38 for the inhibition of both the preservation and persistence of an already established infection, as well as for a secondary infection, and therefore for the spread of an infection, including the blockage of the expansion of a *Flaviviridae*-infection *in vivo*.

40. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 22 to 39 in combination with on another for the treatment and combat of HCV caused hepatitis, Flavivirus caused fever, haemorrhages and encephalitis as well as Pestivirus caused illnesses.

41. Use according to claims 39 and 40 in combination with therapeutics already used in the anti-viral therapy of *Flaviviridae*- infections.

42. Use according to claims 40 and 41 for the treatment of co-infections of various Flaviviruses and Pestiviruses.

43. Use according to claims 34 and 37 for the treatment of co-infections of HCV and immune deficiency viruses HIV-1 and HIV-2.

44. Use according to claim 43 for the treatment of HCV/HIV-co-infections in combination with the HAART-therapy.

45. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 37 for the prevention of a re-infection with HCV during liver and other organ transplantations.

46. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 45 for the prevention of a re-infection with HCV during cell therapies through the giving the agents before, during and after the transplantation.

47. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 45 and 46 for the prevention of a re-infection with HCV during a transplantation of virus-free organs into chronic virus carriers which always have a residual virus burden that can lead to the reinfection of new organs as well as during the transfer of virus-infected organs of donors into virus-free patients.

48. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 38 and 39 for the prophylaxis of a *Flaviviridae*- infection in persons with a high risk of a new infection such as doctors, risk-personnel in houses with a high visitor rate, drug addicts, travellers in highly endemic regions for the *Flaviviridae*, persons in health care or for relatives of chronic virus carriers.

49. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 22 for the production of medicaments for the treatment and prophylaxis of HCV caused hepatitis, Flavivirus caused fever, haemorrhages and encephalitis as well as Pestivirus caused illnesses.

50. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 22, 30 and 34 for the inhibition of both the maintenance and persistence of an already established infection as well as a secondary infection and therefore the spread of the infection, including the blockage of the expansion of an HBC-infection *in vivo*.

51. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 27, 37, 40, 49 and 50 in combination with one another for the treatment and combat of hepatitis.

52. Use according to claim 51 in combination with therapeutics already used in the anti-viral therapy of Hepadna-viruses.

53. Use according to claim 37 and 50 for the treatment of a co-infection with HBV and immune deficiency viruses HIV-1 and HIV-2.

54. Use according to claim 53 for the treatment of HBV/HIV- co-infections in combination with the HAART-therapy.

55. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 22 and 49 for the production of agents and/or pharmaceutical preparations for the inhibition of the release, maturation and replication of hepatitis viruses.

56. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 55 for the production of medicaments for the treatment and prophylaxis of hepatitis.

57. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 22 in pharmaceutical preparations for the treatment of infections due to hepatitis and retro viruses.

58. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 22 for the inhibition of the release, maturation and replication of retro viruses as well as hepatitis viruses.

59. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 58 for the inhibition of the late stages of the replication cycle of retro viruses as well as hepatitis viruses.

60. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 22, characterised in that the assembly and the release of virions from the cell's surface is hindered.

61. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claims 22 and 57 to 59, characterised in that in the case of retroviruses the proteolytic processing of the structural Gag proteins through viral protease are hindered.

62. Use of inhibitors according to claim 22, characterised in that the release, maturation and replication of

a) Spuma-viruses, or
b) Mammalian C-Type Onco-viruses, or
c) BLV (Bovine Leukemia Virus), or
d) HTLV (Human T-Cell Leukemia Virus), or
e) Leukaemia viruses, or
f) RSV (Rous Sarcoma Virus) viruses, or
g) Lenti-viruses

is hindered.

63. Use according to claim 64, characterised in that the release, maturation and replication of

a) HTLV-I or
b) HTVL-II

is hindered.

64. Use according to claim 62g, characterised in that the release, maturation and replication of

a) Humans Immune Deficiency Virus Type 1 (HIV-1), or
b) Humans Immune Deficiency Virus Type 2 (HIV-2), or
c) Apes Immune Deficiency Virus (SIV), or
d) Cats Immune Deficiency Virus (FIV),
e) Cattle Immune Deficiency Virus (BIV)

is hindered.

65. Use of inhibitors of cellular chaperones, or of chemical chaperones, according to claim 61 for the therapy/ treatment of illnesses/ pathological diseases which are caused due to infections with retroviruses.

66. Use according to claim 62g) for the combat / treatment of AIDS.

67. Use according to claim 66 in combination with

67.1 other anti-retroviral medicaments,

67.2 Blockers of the reveres transcription and/or of the viral protease,

67.3 anti-retroviral therapies based on gentherapeutical interventions,

67.4 intracellular immunisation,

67.5 the introduction of anti-HIV-1/HIV-2 effective genes into stem cells and/or peripheral CD4+ lymphocytes.

68. Use according to claim 66 for the therapy/ treatment of AIDS in an advanced state of disease.

69. Use according to claim 66 for the prevention of an illness outbreak and for the reduction of the spread of the infection in the organism (reduction of the "viral load") of symptom-free HIV-1/HIV-2 seropositive and HIV-1/HIV-2 infected persons.

70 Use according to claim 66 for the treatment/ therapy/ prevention of HIV-induced demence, especially for the prevention of the HIV-infection of neurons, Glia-, and Endothel-cells in the capillaries of the brain.

71. Use according to claim 66 for the prevention of the establishment of a systematic HIV-1/ HIV-2-infection directly after coming in contact with infectious viruses, for example due to pinprick injuries with HIV-contaminated blood or blood products.